Rangia clam investigations in Texas bays: a growth-increment perspective

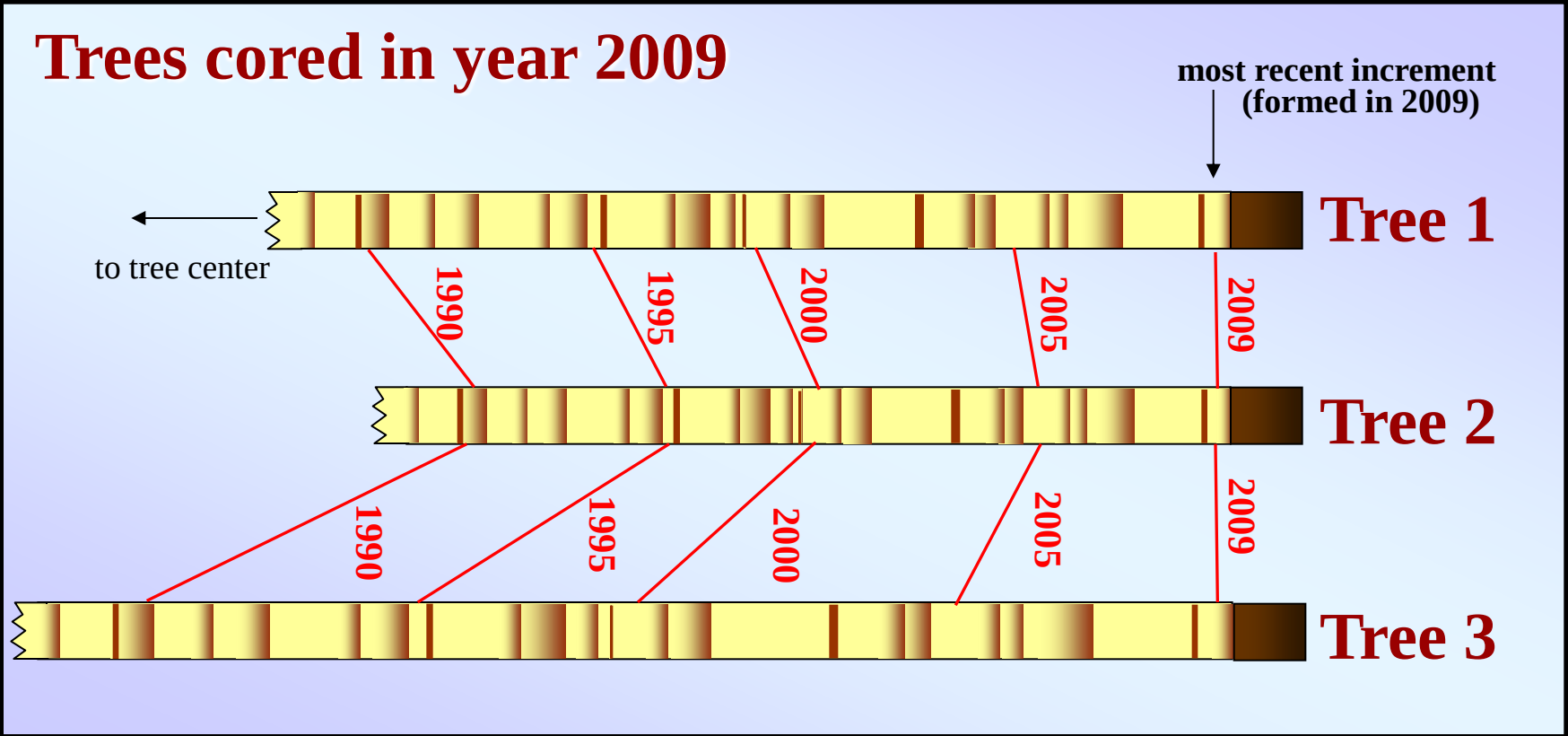
Bryan A. Black, Matthew Dzaugis
Department of Marine Science

Marine Science Institute
University of Texas at Austin
Port Aransas, Texas

Steve Raabe, Rebecca Reeves, SARA
Marty Heaney, Bio-west, Inc.
Norman Johns, National Wildlife Federation

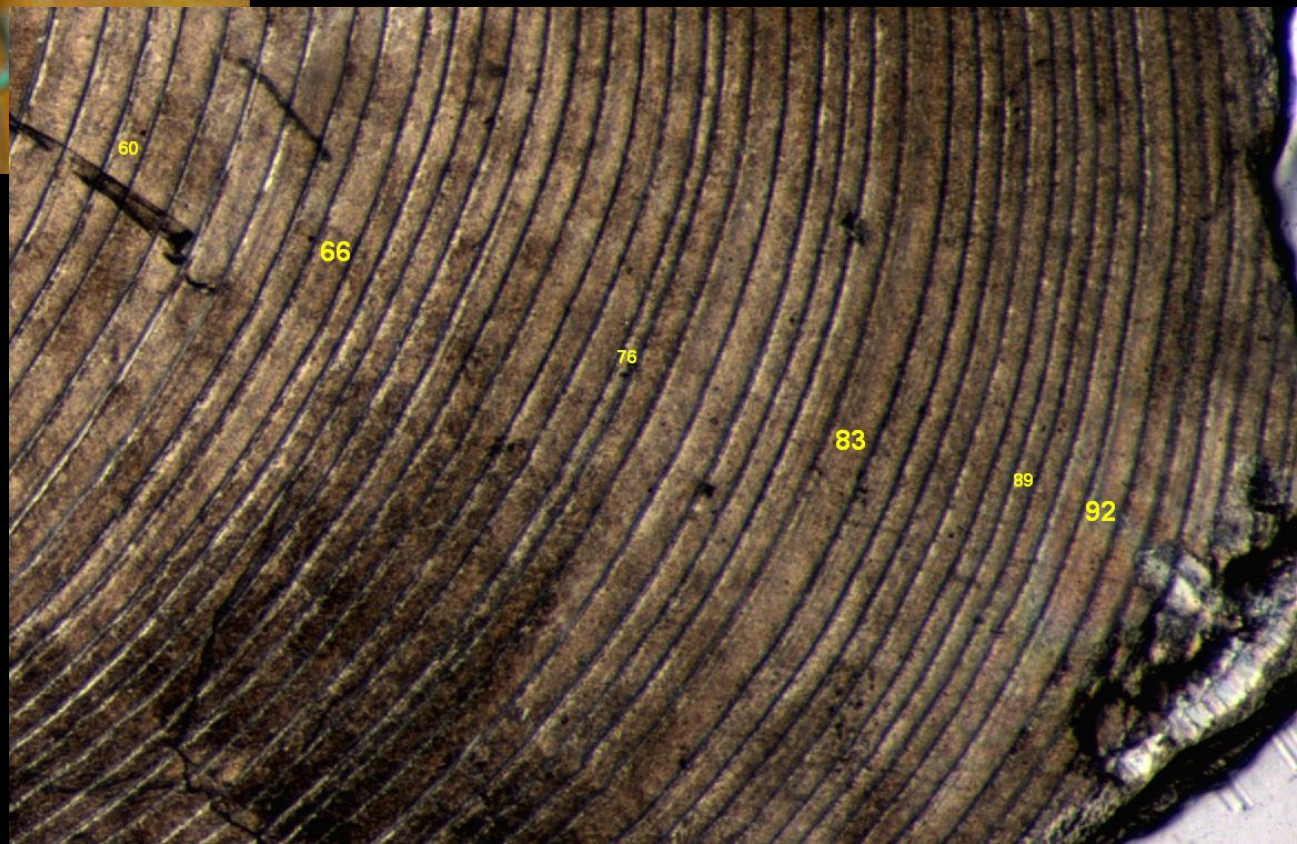
Crossdating

Matching growth "bar codes"



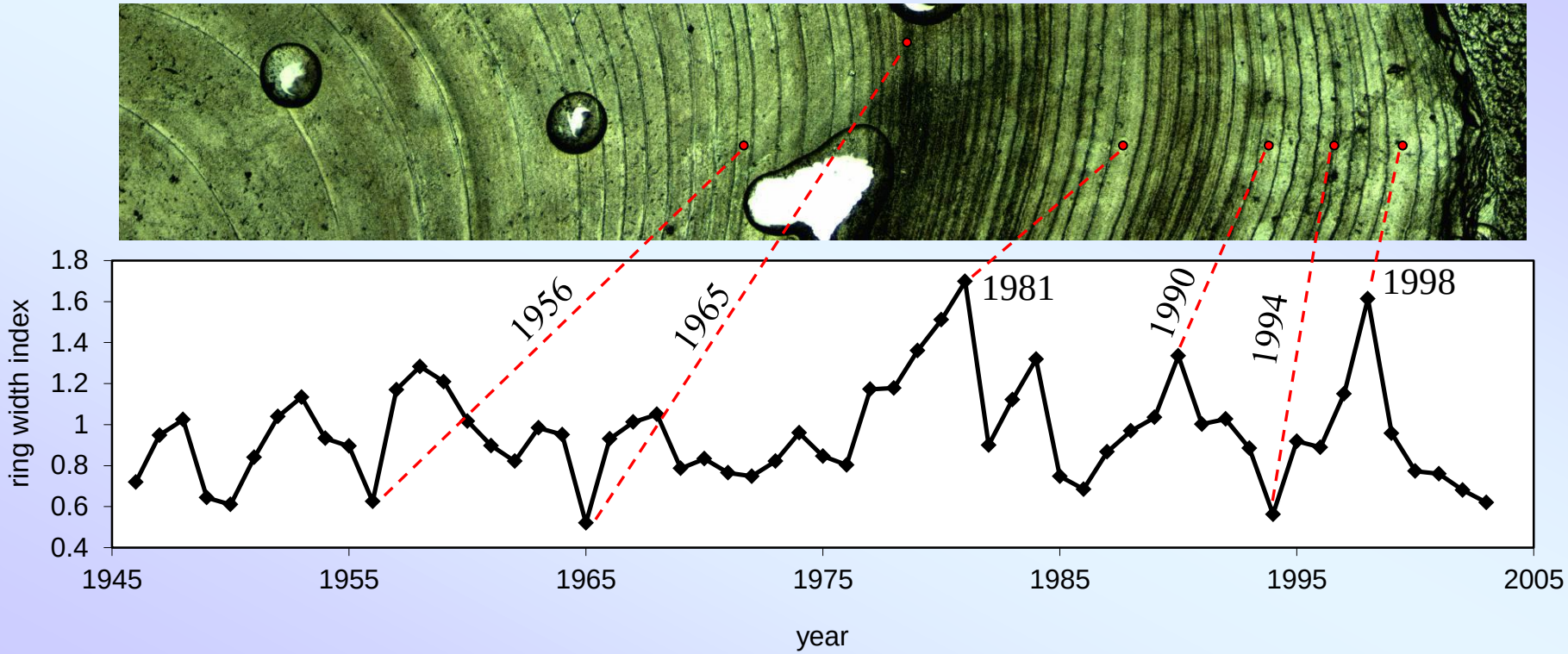
Pacific Geoduck: northeast Pacific Ocean

growth increments in hinge plate

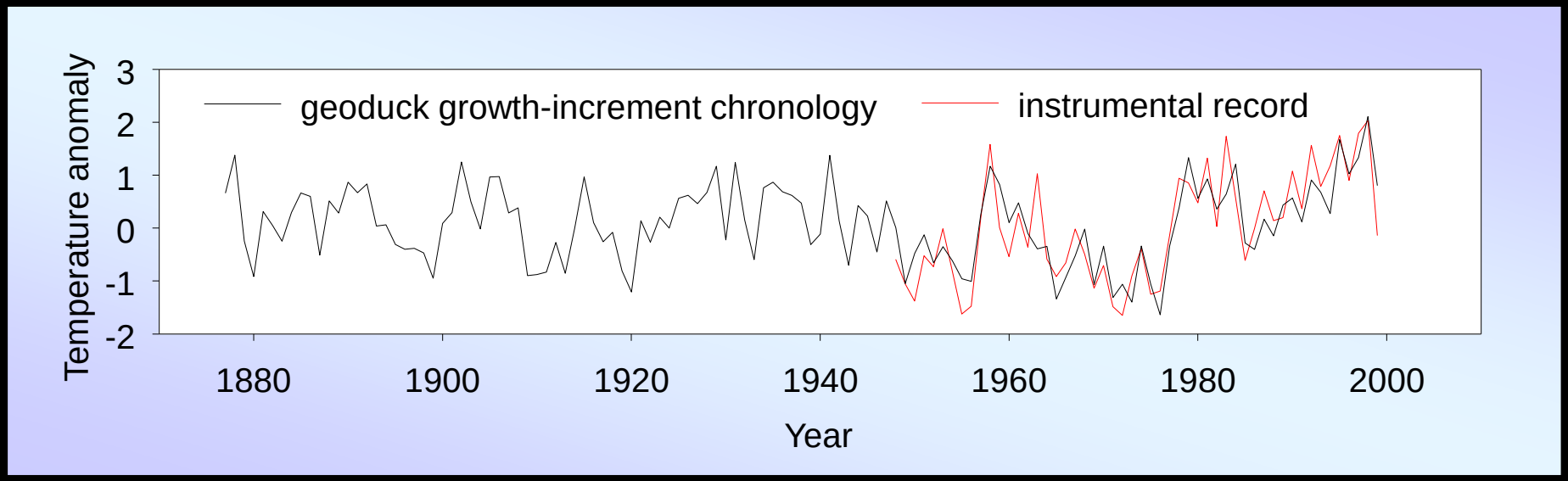


Population age structure

Example: geoduck peel



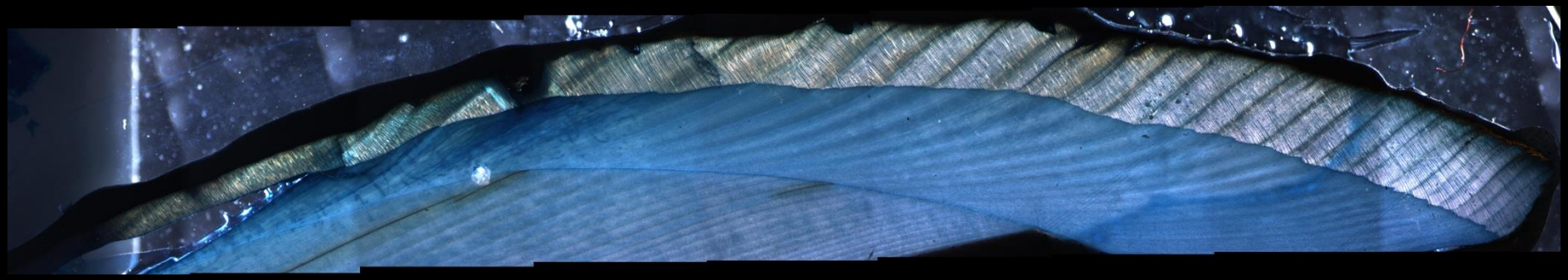
Annual water temperature in NE Pacific

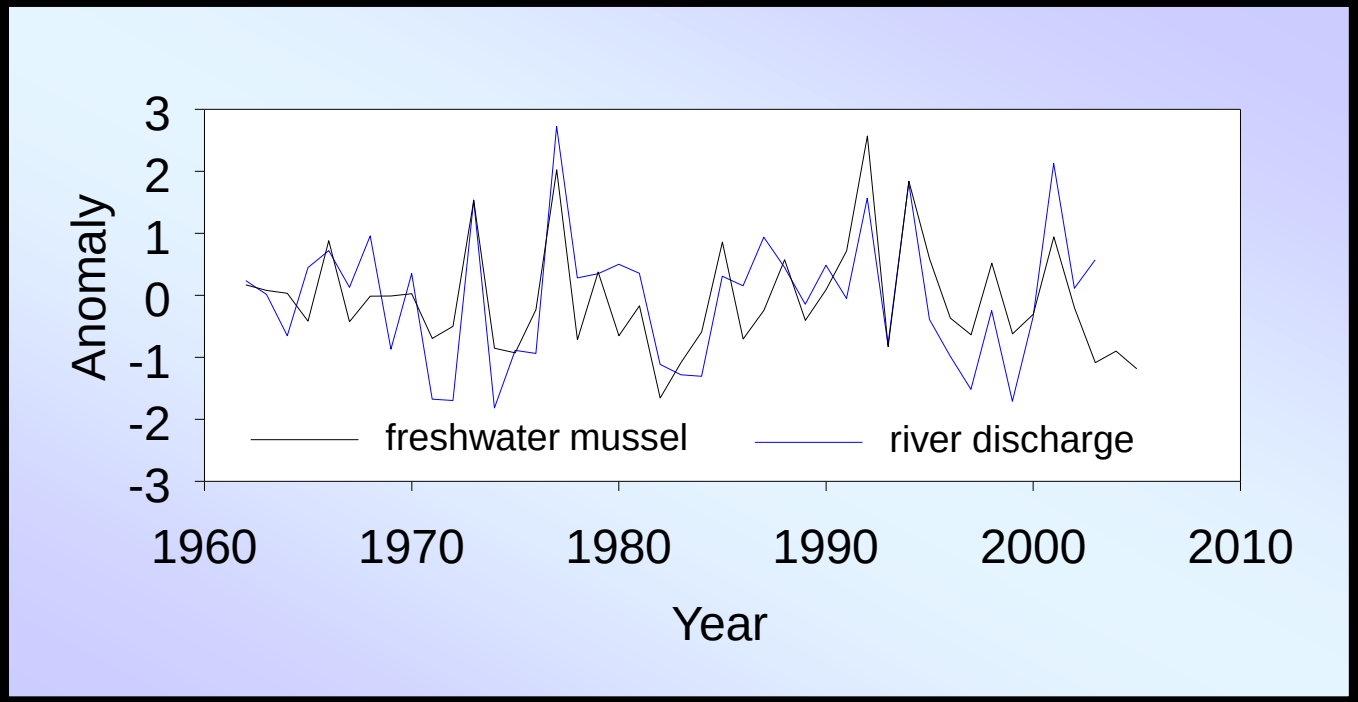


1. geoduck an indicator of water temperature

2. long-lived: can use to hind-cast temperature

Freshwater mussels (Margaritifera, Gonidea)





mussel growth an indicator of river discharge (flow)

Rangia

Is *Rangia* growth or recruitment an indicator of temperature, flow, and / or salinity?

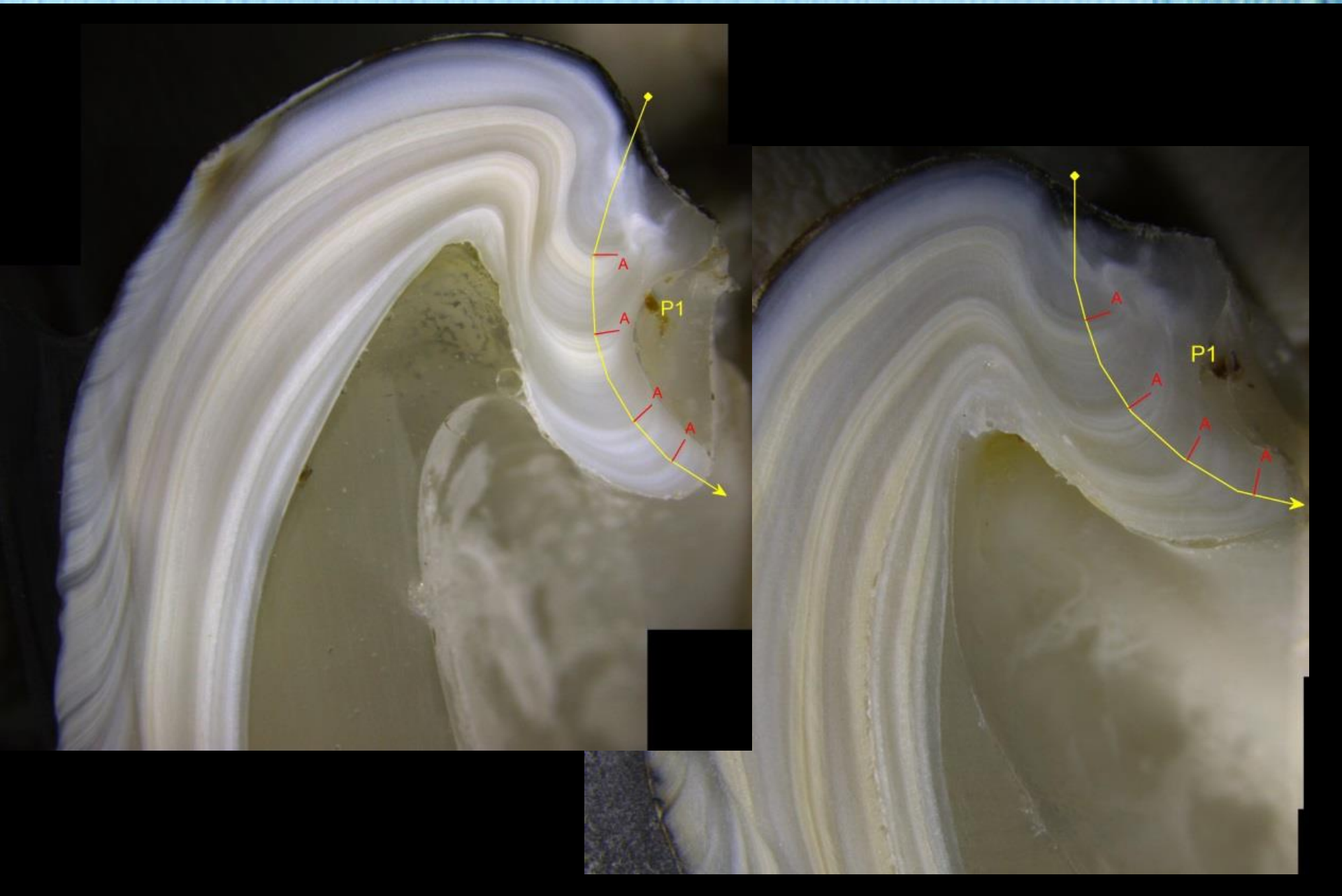
Questions to answer:

1) Longevity of *Rangia* in TX bays
2) Are growth increments well-defined and able to be measured?
3) Can growth chronologies be developed?
4) Can recruitment histories be developed?
5) If so, how do they relate to climate?
6) How does age-specific growth compare across bays? Between live- and dead-collected samples?

Rangia

General sampling locations

Rangia increments

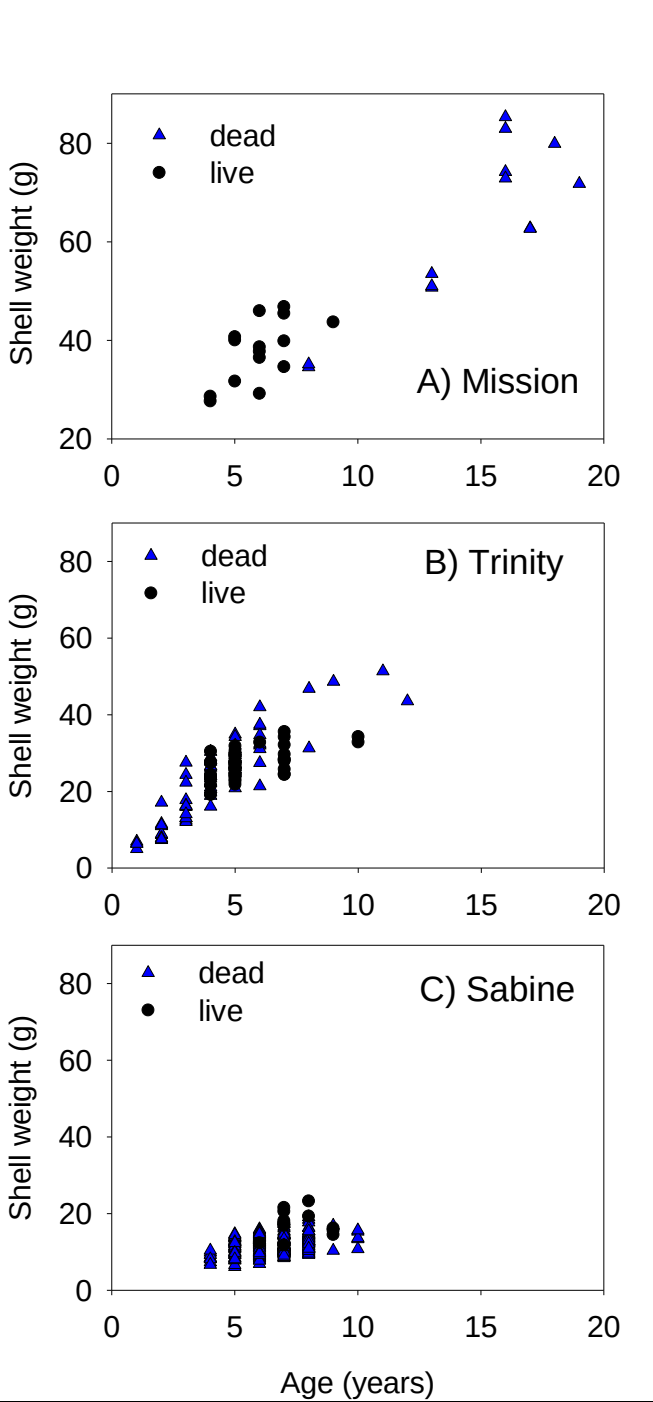


Rangia size

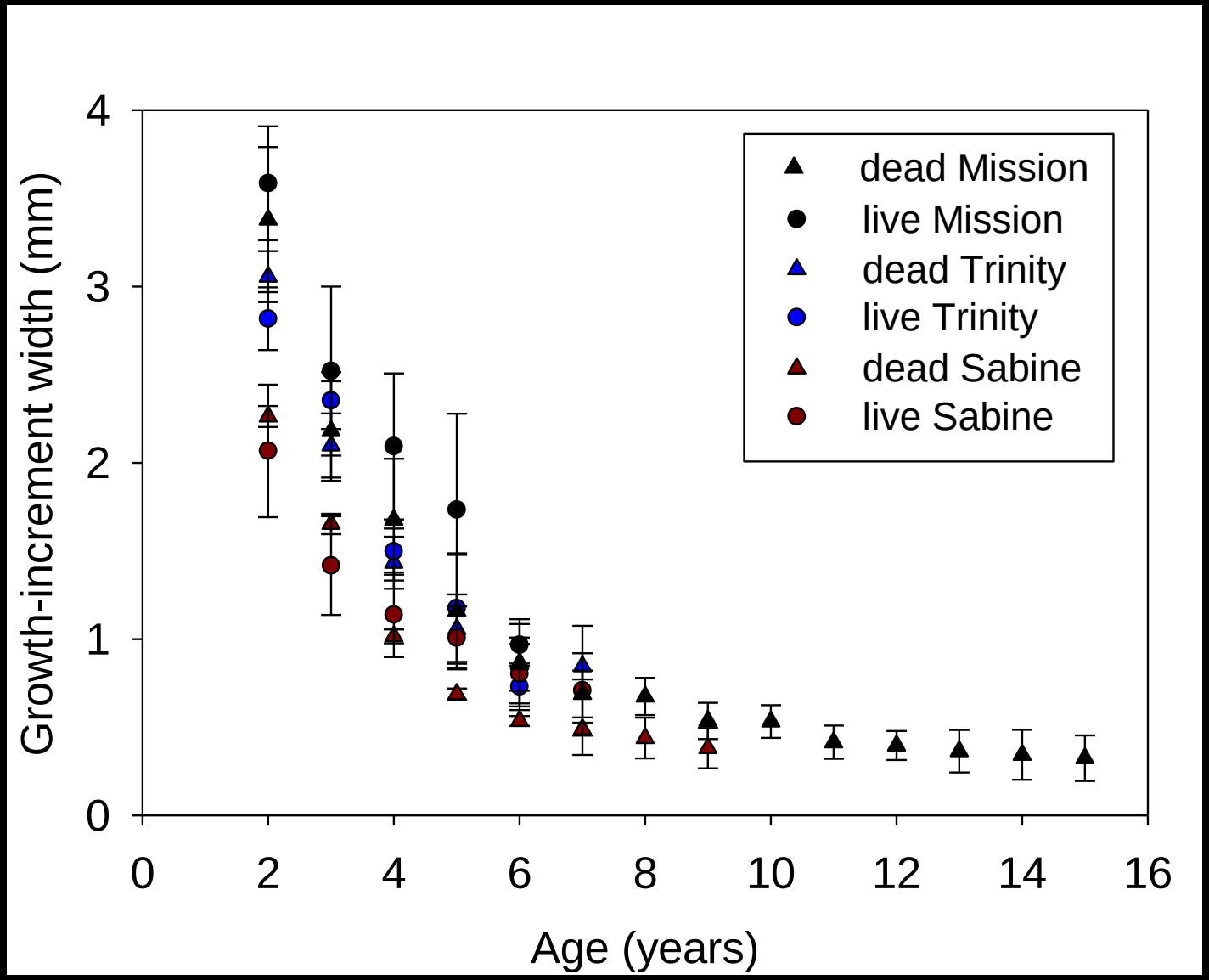
Age-weight relationships

Trinity

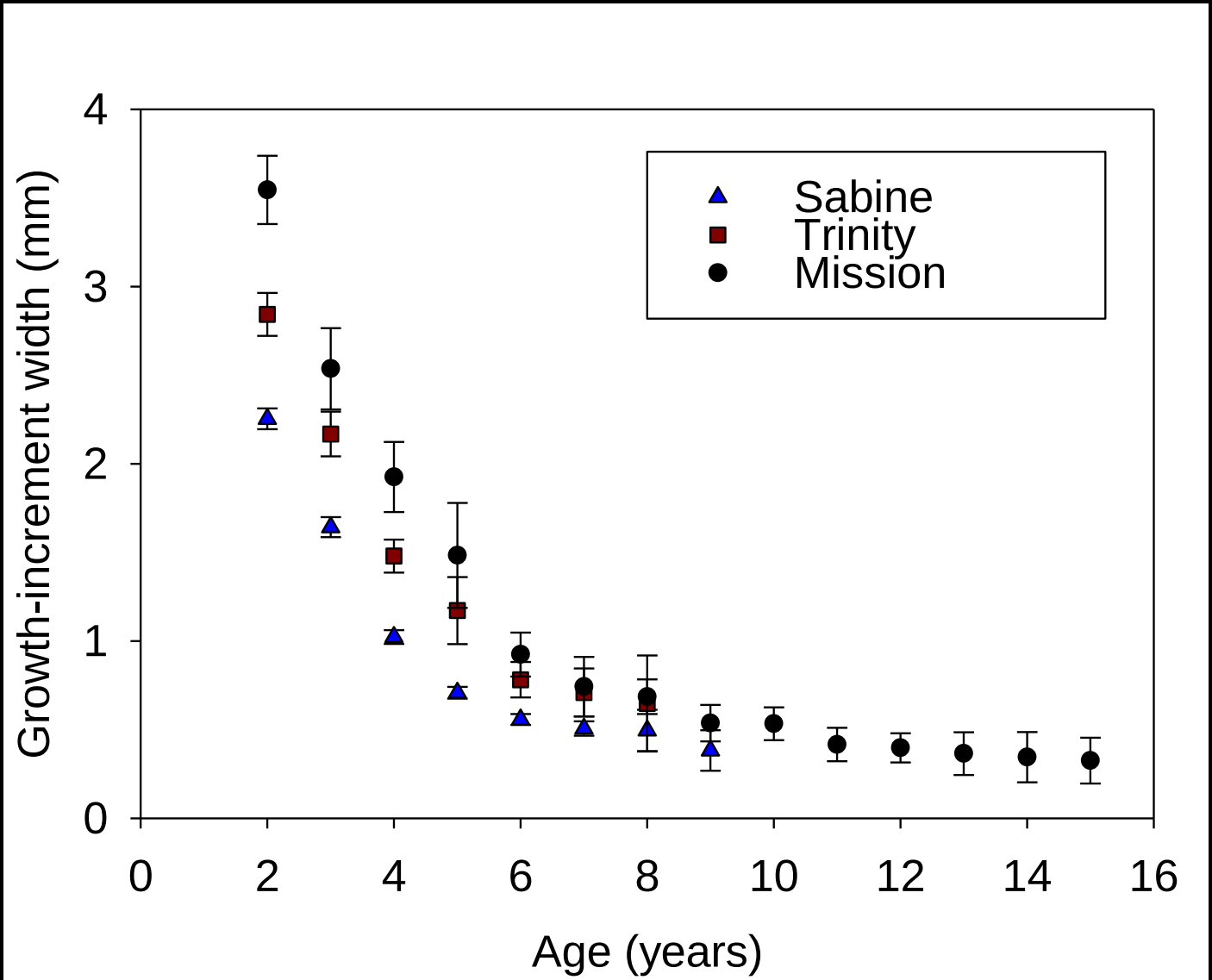
Sabine



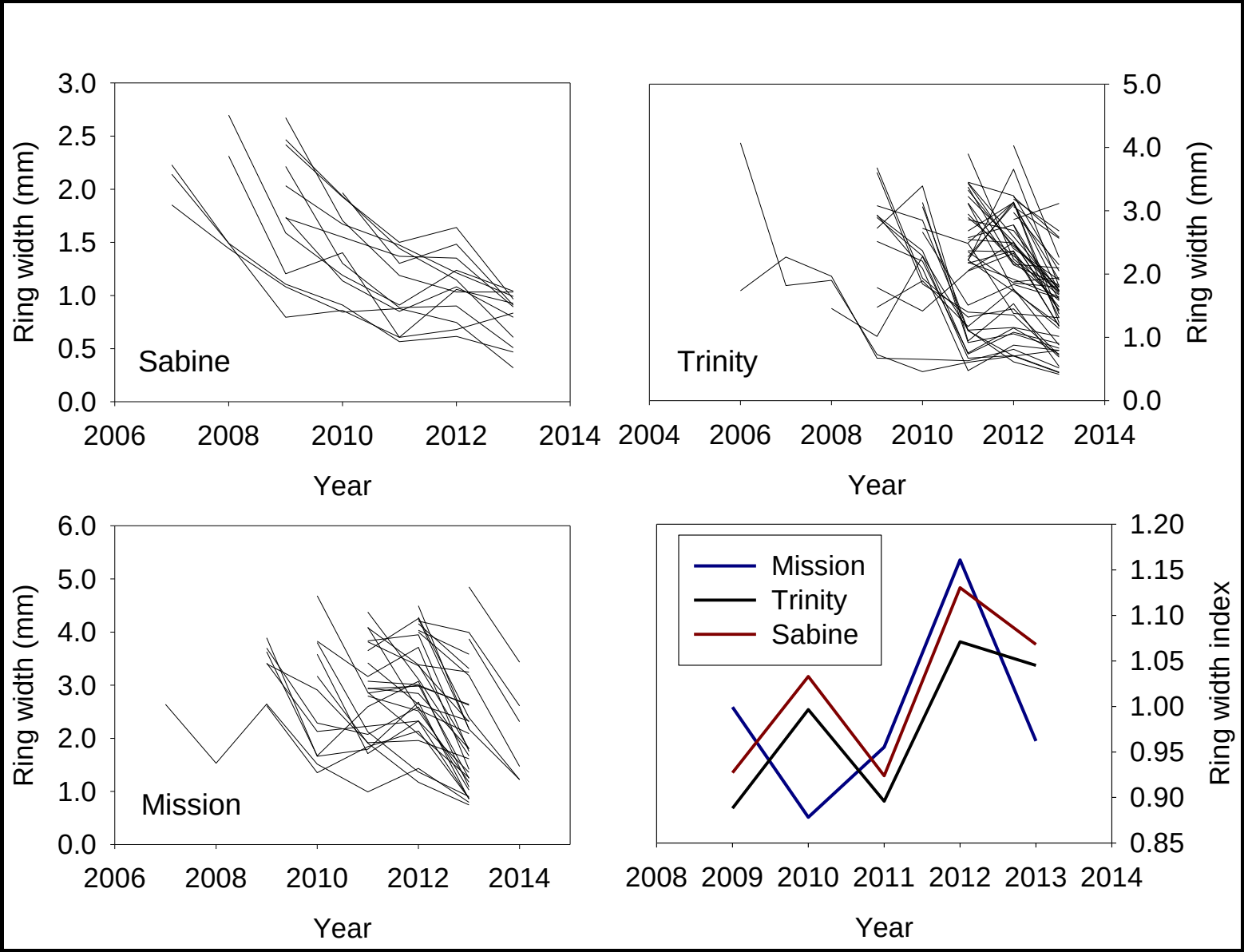
Rangia growth trajectories



Rangia growth trajectories

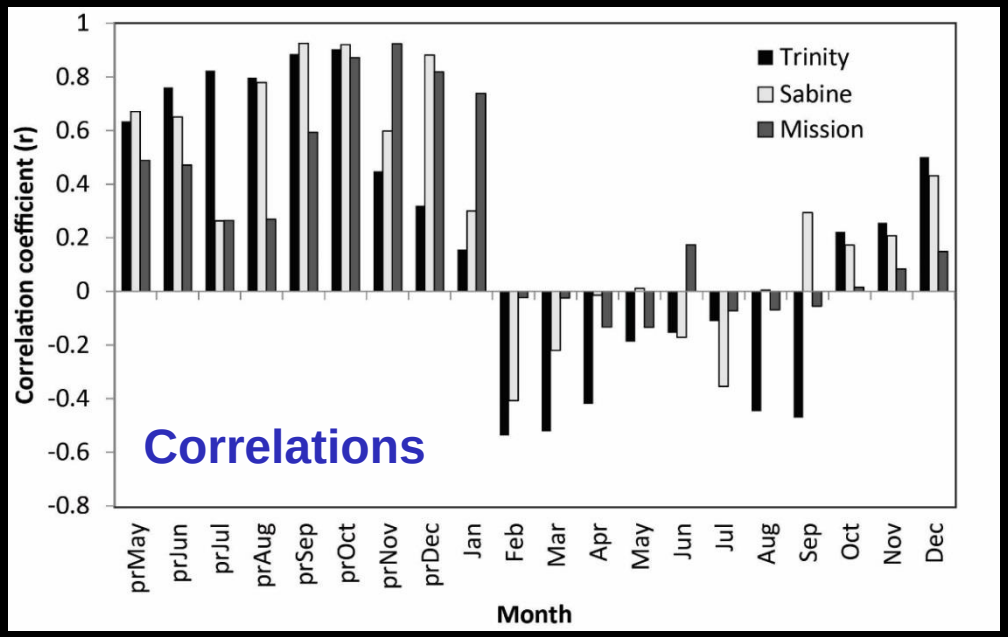


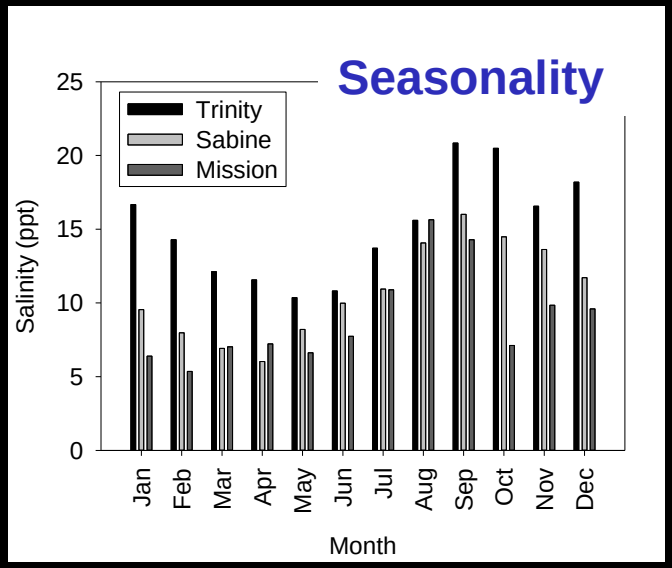
Rangia live individuals



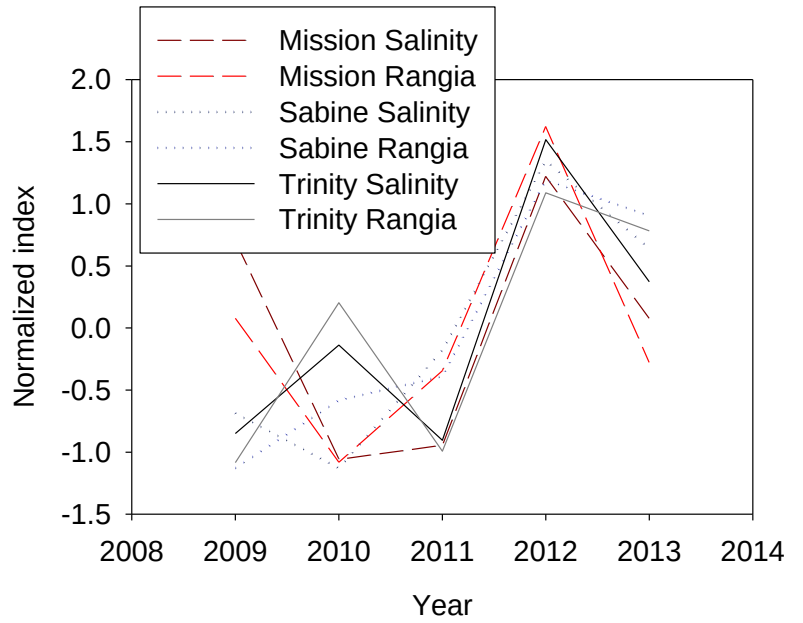
Rangia climate

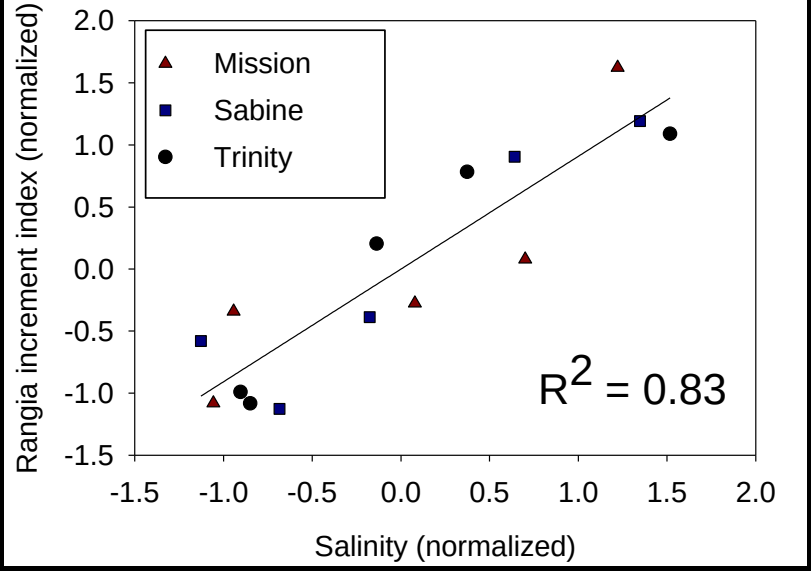
Temperature: No
Flow: No
Salinity: Yes



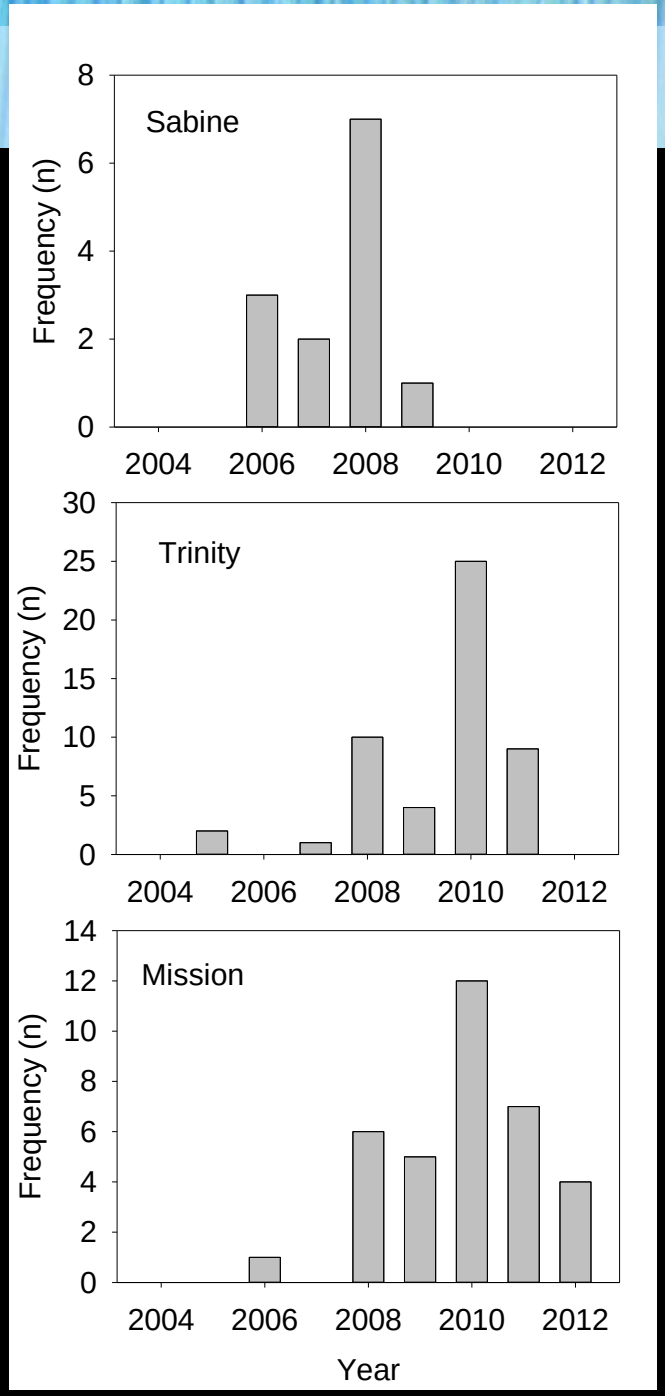


Rangia climate





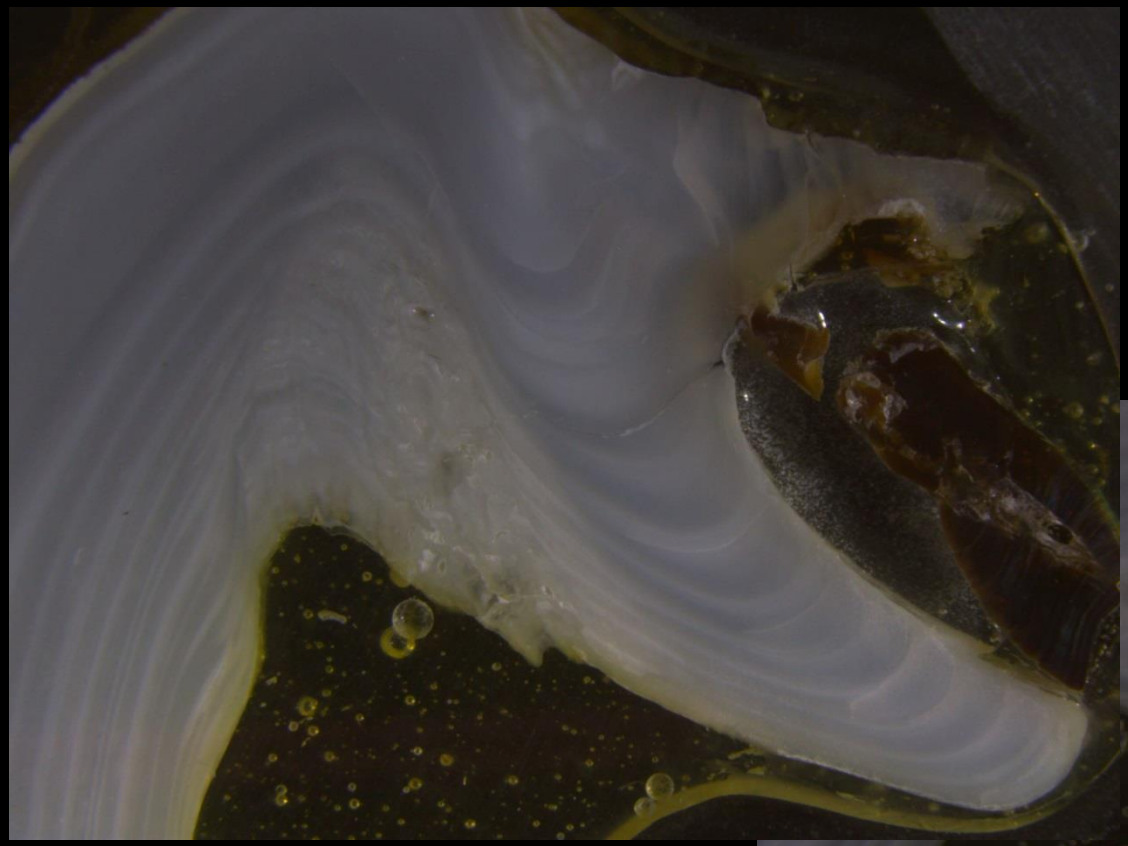
Rangia recruitment

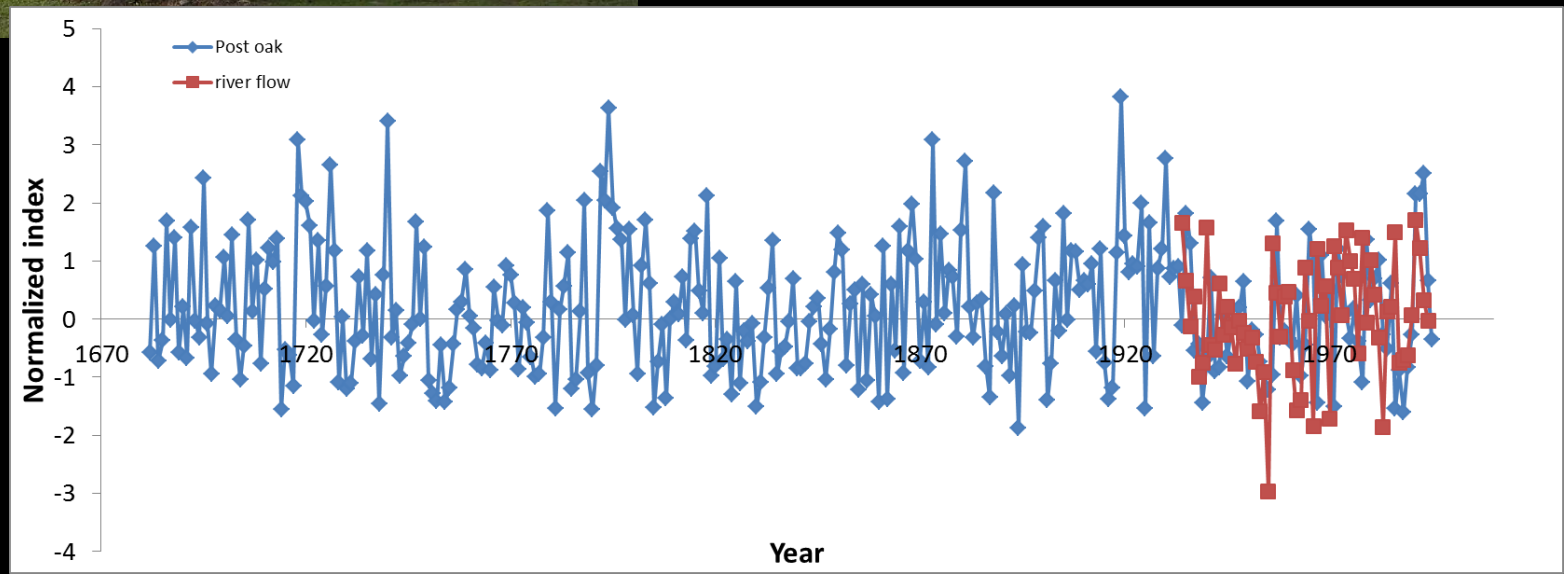


Conclusions

1) Live *Rangia* are presently uncommon
2) No growth difference between live and dead shells
3) East (slow) to west (fast) gradient in growth
4) Growth synchrony within and among sites
5) Growth anomalies + correlate to salinity anomalies
6) Correlations strongest in fall when salinities highest
7) Recruitment history short and coarse
8) Environmental correlated for shell growth may be different than those for recruitment

Future directions



Middens?
Rivers?

Oaks, elms, and drought